

## COAL SEAM GAS (MORATORIUM) BILL 2011

**Bill introduced, and read a first time and ordered to be printed on motion by the Hon. Jeremy Buckingham.**

### **Second Reading**

**The Hon. JEREMY BUCKINGHAM** [12.08 p.m.]: I move:

That this bill be now read a second time.

The Greens Coal Seam Gas (Moratorium) Bill 2011 is an important bill. I am proud to introduce this bill on behalf of the tens of thousands of people in New South Wales concerned about the impact of coal seam gas on communities and the environment. As a country Green I am proud to be able to introduce my first bill, which is grounded in protecting regional New South Wales, our precious water systems and our agricultural land. Almost 30 per cent of the land mass in New South Wales is covered by a petroleum exploration licence.

The following areas are also subject to petroleum exploration licences: Jervis Bay, the Illawarra, the majority of the Southern Highlands, the entire Sydney basin and parts of the Blue Mountains, the Central Coast, Putty, Cessnock, Newcastle, Taree, Port Macquarie, the Gloucester Valley, the Lower Hunter, the Upper Hunter, Mudgee, the Liverpool Plains, Narrabri, around Dubbo and Moree, Grafton, Byron Bay, Lismore, Casino and the Border Ranges. The licences were issued without community engagement, without notice to landholders and with no regard to the potential impact that coal seam gas exploration might have on the existing land uses within those communities. The community knows now. For every one of those purple blobs on the MinView website that indicates a petroleum exploration licence [PEL] there is now a grassroots committee group, or in some cases two or three, that have started in the last 12 months to oppose the coal seam gas industry. It has been just over six months since notice of this bill was given. In that time the public campaign for a moratorium has been a deafening roar that no politician with any real interest in the concerns of their community can ignore any longer.

Since that time the expansion plans of the industry have become clear and the limitations of the current regulatory environment are now starkly evident. Despite clear concern from the public and experts alike, this Government has allowed exploration drilling in Putty, on the edges of the Blue Mountains World Heritage Area, just north of Stockton beach through the aquifer that supplies a significant amount of Newcastle's drinking water, in the Hunter Valley and now on the Liverpool Plains. This is despite pollution incidents occurring near Campbelltown and in the Pilliga—the only two operational gas fields in New South Wales—both of which resulted in Environment Protection Authority action. That action occurred only after footage was obtained by campaigners of potential breaches of licence conditions and made available to the media. Far from being a scare campaign by narrow political interests, as it has been described and suggested by members of the Government, the movement for a moratorium on coal seam gas constitutes dozens of community groups spread widely across the State, representing members from all political and non-political backgrounds.

The community groups consist of farmers, scientists and environmentalists in both the city and regional New South Wales who have support for their position statements from relevant and respected peak bodies with legitimate interests in food and water security, environmental protection, social development, community cohesion and public health. Those peak bodies include the National Water Commission, the New South Wales Farmers Association, Doctors

for the Environment Australia, the Livestock Health and Pest Authority, the Sydney Catchment Authority, dozens of regional and urban local councils and the Country Women's Association. It is a list of organisations that are not well practised in scare campaigns supported by narrow political interests. These groups are united in their call for a completely reasonable policy shift—one based on the precautionary principle, a founding principle in ecologically sustainable development, a policy that any responsible and caring government would support. The community wants a moratorium on coal seam gas while appropriate research is undertaken to assess the potential economic, environmental, social and health impacts of coal seam gas.

This is a bill that could have been introduced by the last Government and should have been introduced by the last Government. By the end of 2010 there was significant community concern about the coal seam gas industry. Plans for exploration at St Peters—in Premier Keneally's own electorate—were discovered by the Hon. Cate Faehrmann in a call for papers pursued by The Greens in the last Parliament. That discovery brought home just how far this industry had already pushed forward under an uncertain and inadequate regulatory regime. At that point few in the Government, not to mention the community, even knew about the exploration licences over the metropolitan area. Everyone thought that surely if there was any area not suitable for industrialisation by the coal seam gas industry it would be high-density urban areas. Now that the Labor Party has a clear moratorium policy, the unnecessary hardship and concern created across New South Wales communities over the last year because of inaction by the former Labor Government is all the more difficult to bear. Regardless, The Greens welcome the change in position by the Labor Party on this issue.

The opportunity to address community concerns about this industry now sits with the Liberal-National Coalition. Their members occupy many of the electorates directly impacted by current exploration and planned production. The Government clearly recognises the land use conflicts that will result from the coal seam gas industry as it is a feature of its strategic regional land use policy. Almost eight months into this Government's term, the application of that policy looks certain to be delayed. According to the key stakeholders involved in the process, it falls well short of expectations. Given that coal seam gas production projects are approved, but not yet started, in Casino and Gloucester—

**The ASSISTANT-PRESIDENT (Reverend the Hon. Fred Nile):** Order! Members will reduce the level of conversation in the Chamber.

**The Hon. JEREMY BUCKINGHAM:** There are more production projects proposed in Camden and the Pilliga forest, with pipelines planned to crisscross our most productive agricultural areas. There is no more time to lose. We must address the potential risks of coal seam gas, and a moratorium offers the best way to ensure no further damage will occur while that work is done. What is coal seam gas? I understand that for many members in this place, and for many in the general public, the rapid escalation of the campaign against coal seam gas seems sudden and potentially confusing. Over recent years there has been a growing acceptance, driven largely through marketing by the energy industry, of gas as a cleaner fossil fuel alternative to coal for electricity or as a transport fuel to replace petrol and diesel. Many of the city's buses are labelled as being powered by clean natural gas, many households continue to have gas cylinders delivered, which they use to power their stoves, water and space heaters, and for many others it is simply piped into their homes.

I acknowledge the perception that gas is seen as safe and clean. Approximately 6 per cent of New South Wales' domestic gas is currently extracted from coal seams beneath south-west Sydney. It is important to note that there is a fundamental difference between the gas we have

traditionally imported from the Cooper Basin in South Australia for domestic supply in New South Wales and the coal seam gas that is now being produced on a small scale. Exploration for coal seam gas is increasing in New South Wales. The difference is the method of extraction and the reason for the difference is related to the geological formation in which the gas is held and the complexity of extracting that gas from those formations.

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I do not profess to be an expert in geology, hydrogeology or engineering and I understand there are a number of unique circumstances in each environment that might change the way that gas mining happens—the drilling methods involved and the well completion technologies are all different. But here is Coal Seam Gas 101 for Dummies—not that I am casting any aspersions over my learned colleagues in this place—but when one understands the basics of coal seam gas, one knows that there are a few risks that need to be assessed before any decision can be made on whether to proceed with this industry. Coal seam gas is gas extracted from within coal seams and is often referred to as "CSG". Coal seam gas is what is known as an unconventional gas because it requires a different and more complicated extraction method to that which has been used to access the conventional gas we are used to from the South Australian gas fields, Bass Strait or the North West Shelf.

Shale gas is another unconventional gas and uses similar extraction methods to coal seam gas. The end-use product for both conventional and unconventional gas is methane. For coal seam gas, the methane is bonded to the coal and held in place by water pressure. To allow the gas to flow, the water pressure has to be reduced and this is done by pumping the water out of the coal seam and to the surface. The water in the coal seam is very old saline and contains other chemicals naturally occurring in the coal seam, including the highly-toxic BTEX range of chemicals. To help improve the rates of gas flow, the coal seam is often hydraulically fractured, or fracked, by forcing thousands of litres of water, sand and chemicals under high pressure into the well to crack the coal. The fracture is held open with the sand, which enables the gas to flow more easily. Only some of the chemicals pumped into the seams are recovered, with a significant proportion remaining in the underground environment.

Because water continues to flow through the coal seams and the water pressure can build up and slow the gas flow, water continues to need to be extracted from the well. This also means that wells are required at regular intervals to access all the gas within the coal deposit. Depending on the drilling technique, wells are needed at intervals as little as 500 metres apart. This means that an available gas field will need hundreds or thousands of wells. Some 20,000 wells are already approved in Queensland, with 40,000 projected. Each of these wells is connected by gas and water pipes, as well as a service road. Processing and compressor stations as well as water storage facilities and desalination facilities are other features of the CSG landscape. Some of the producing wells in New South Wales are already showing flow rates dropping off after only a few years. Some wells have had to be abandoned and other refracked to stimulate flow. To maintain the viability of a field, there is a need to continuously expand the field and construct new wells.

It can be seen from that simple explanation that a number of risks are presented by coal seam gas. First, a lot of water is extracted. That water is saline and contains other chemicals previously trapped within the coal seam that, when brought to the surface, need to be managed as wastewater. Secondly, fracking water containing chemicals is pumped at high pressure into the underground environment. This has the potential to create fractures in the underground environment that can lead to gas and/or water migration between the coal seam and overlying aquifers and potential contamination of aquifers. Thirdly, the surface infrastructure is substantial, with hundreds of thousands of wells and thousands of kilometres of roads and pipelines needed as well as other processing and water-management

infrastructure.

These risk areas are clear and they are acknowledged by the industry. What is also absolutely clear is that the evidence available to decision-makers in assessing the risks and in implementing mitigation strategies is not clear, not conclusive and nowhere near complete. There is tremendous uncertainty in almost every risk area, and it is a completely reasonable expectation that these uncertainties should be explored before any further consideration of coal seam gas development is allowed. The notion adopted by the Planning Assessment Commission in New South Wales, and seemingly supported by the planning department, of adaptive management is simply an irresponsible suck-it-and-see approach, which cannot be allowed to continue.

There are key problems. From these key areas of risk I want to highlight five specific problems that need to be better understood and fully addressed if the industry is to have any future. First, millions of litres of saline chemical-laden wastewater is produced to obtain the gas. As I mentioned earlier, coal seam gas is held in the coal seam by water pressure. To allow the gas to flow, this water must be pumped out. This water is known as produced water and there is a lot of it. In Gloucester, where AGL is approved to drill 110 gas wells, the company expects the equivalent of one Olympic swimming pool per day of this wastewater to be extracted. At full capacity across the planned field of 330 wells, three Olympic-sized swimming pools of water a day will need to be treated and managed. The National Water Commission has also raised concerns about the volume of water that could be extracted by coal seam gas development, and in a position paper in December 2010 stated:

Current projections indicate the Australian CSG industry could extract in the order of 7,500 gegalitres of co-produced water from groundwater systems over the next 25 years, equivalent to 300 gegalitres per year.

This volume is more than half of existing total extraction from the Great Artesian Basin. In New South Wales and Queensland, where both governments have indicated plans—

**The Hon. Dr Peter Phelps:** Hold on, now you are being deliberately disingenuous. You know full well they come from different aquifers.

**The Hon. JEREMY BUCKINGHAM:** They are interconnected. In New South Wales and Queensland, where both governments have indicated plans to ban evaporation ponds because of the inherent risk of leakages or overflows and air emissions from the volatilisation of chemicals within the produced water, it is now not clear what the industry strategy for wastewater management is. The cost of reverse osmosis on the scale required may not be viable and does not remove all the chemicals. Releasing produced water to the surface environment is unacceptable without substantial treatment and the concentrated waste still needs to be managed. Currently there is no viable reuse strategy and claims by industry of having created a new water resource for agriculture is simply ludicrous, unless we plan on exposing our food systems to a chemical cocktail. Secondly, the extraction of water from the coal seam results in losses from freshwater aquifers above that. Those aquifers often support stock and domestic use.

One impact from the massive volumes of water extracted from coal seam gas wells is a draw-down on freshwater aquifers above the coal seam. In the National Water Commission paper mentioned previously there is a specific mention of this risk highlighting the impacts of dramatic depressurisation on the coal seams, including changes in pressure in adjacent

aquifers and consequential changes in water availability. These concerns are not new. A 2005 report "Coal Bed Methane Hazards in New South Wales" concluded:

The development of a significant gas field in the district [of Wyong] based on Coal Bed Methane will severely impact on the security of supply of this water, by radically altering the groundwater levels and purity.

The more recent studies relied on by industry to clarify the impact on groundwater systems have also been inconclusive and had to rely on industry data to base assumptions. A recent paper prepared by the University of Southern Queensland was used by the Australian Petroleum Production and Exploration Association, the industry's peak body, to justify its claims of minimal impacts to the water relied on by farmers using water from the Great Artesian Basin. The author of the report was forced to put out a clarifying statement to the effect that the conclusions of the Australian Petroleum Production and Exploration Association could not be drawn from the report's findings. The blockade against planned exploration drilling by Santos currently in progress near Caroona on the Liverpool Plains has come about because the community is fed up with the disregard by this industry and the regulator of the threat to groundwater availability from coal seam gas.

**The Hon. Dr Peter Phelps:** It's because they've been scared silly by Green extremists. Green extremists have scared them unnecessarily.

**The Hon. JEREMY BUCKINGHAM:** I will acknowledge the interjection that the farmers of the Caroona Coal Action Group have been "scared silly by Green extremists". I totally reject that, and they would reject it too. They have made up their own minds, without any pressure from The Greens. There has been long-held community and seemingly government support for the Namoi Catchment Water Study but there is now a very strange and unjustifiable push to move ahead with exploration activities before the study has reported. It is just another example of putting the cart before the horse in relation to coal seam gas.

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The third major issue is that fracking risks contamination of freshwater aquifers. Fracking forces a mix of water, sand and chemical into the coal seam gas well at high pressure to fracture the surrounding coal in order to improve gas flow rates. It also has the potential to create fractures outside the seam and can link the coal seam with overlying freshwater aquifers. This potentially exposes freshwater aquifers to fracking chemicals and other contamination existing within the coal seam. Fracking has been banned in France and is currently suspended in areas of the United Kingdom. It is suspended pending review in Quebec, Canada, and is subject to strict conditions in New York State in the United States, including a ban within primary aquifers and within the drinking water catchment. A recent report showed fracking near water bores increased methane levels in those bores to potentially explosive levels. The paper observes:

... average and maximum methane concentrations in drinking-water wells increased with proximity to the nearest gas well and were ... a potential explosion hazard ...

The gas escapes from well casings or via pre-existing or new fissures from the gas seam once its retaining water is extracted through the well—known as dewatering. The gas migrates upwards into shallow aquifers or escapes into the open atmosphere. Already footage from Queensland gas fields shows gas leaking from around well casings and water bores. If these links are possible and gas can migrate, so can the chemical cocktail used in fracking. The National Toxics Network has looked into these chemicals and in February 2011 produced a briefing paper on hydraulic fracturing. The paper reported that only two of the 23 most recognised fracking chemicals had been assessed by the Australian industrial chemicals

regulator and that none had been assessed for use in fracking. At a recent Senate hearing into the industry the national chemical regulator admitted that it was taking the lead on the chemicals that should be assessed from the National Toxics Network but it did not have the resources to assess all the chemicals involved before they had been used in coal seam gas extraction.

The fourth area relates to the carbon emissions from the entire coal seam gas process. Claims by the industry of coal seam gas being a clean, low-emissions technology are contested. The critical question as it relates to coal seam gas is the fugitive emissions from the production process. A recent Cornell University study suggests that the fugitive emissions—methane that escapes into the atmosphere during the production of gas—created in shale gas production in the United States were so significant as to potentially make the carbon footprint of shale gas larger than coal when used for electricity generation. The processes for shale gas extraction are similar to those used for coal seam gas extraction. Because methane is 20 times more greenhouse potent than CO<sub>2</sub> over a 100-year timescale, it pushes up dramatically the carbon equivalent footprint. It is even worse if it is turned into liquefied natural gas for export because a significant portion, estimated at around 10 per cent of the gas, is used in the refrigeration process to liquefy the gas.

The Australian Petroleum Production and Exploration Association [APPEA] continues to claim that, even when full life-cycle emissions are considered, coal seam gas used for electricity is up to 70 per cent less greenhouse intensive than coal. The recently released Worley Parsons report on which this claim is based makes assumptions about the fugitive emissions without addressing the new research from Cornell University, which points to leaks being much higher than previous assessments. It is simply not viable for industry to continue to make the claims of 70 per cent. Much more Australian-based research is needed before either government or industry can legitimately claim that coal seam gas can help to reduce greenhouse gas emissions.

The final area of concern I address is the surface infrastructure required for coal seam gas. The spider-web effect of wells placed in a grid pattern spaced as little as 500 metres apart connected by pipeline corridors and roads will destroy agricultural land and drastically impact on biodiversity and bushland. Members would be aware that I am a member of the committee inquiry into coal seam gas. Norco, one of the largest dairy cooperatives in Australia, in its submission to the inquiry said that if coal seam gas production were approved within its agricultural production areas it would destroy its industry. The two could not co-exist.

**The Hon. Dr Peter Phelps:** What hypocrites! The Greens hate intensive production of agriculture anyway.

**The Hon. Robert Brown:** Point of order: I cannot hear the debate.

**The ASSISTANT-PRESIDENT (Reverend the Hon. Fred Nile):** Order! Members will cease interrupting the member with the call.

**The Hon. JEREMY BUCKINGHAM:** As I said, the spider-web effect of wells placed in a grid pattern spaced as little as 500 metres apart connected by pipeline corridors and roads will destroy agricultural land and drastically impact on biodiversity and bushland. To those members involved in the coal seam gas inquiry who have flown over Chinchilla it is clear that any idea of agricultural co-existence with that type of operation is plainly absurd. Make no mistake about it: This industry would result in a wholesale industrialisation of large parts

of regional New South Wales. In Queensland 40- to 50-metre wide corridors are being pushed through remnant bushland and across farmlands. Pipelines to export facilities will be even bigger. Farming communities understand this. They know that this industry cannot operate within the context of modern agriculture. Any one of these five key issues requires substantial further assessment. When considered together, it is clear that we are a long way off being able to make an informed decision about this industry.

I now turn to the details of the bill, which will give us time to pause and reflect on the future, if any, of the coal seam gas industry in New South Wales. The Coal Seam Gas Moratorium Bill 2011 seeks to achieve two simple objectives. First, it creates a 12-month moratorium on any new coal seam gas prospecting or mining activities within New South Wales. Any projects already operating under a petroleum production lease will be exempt from the 12-month moratorium period. However, any prospecting activities, including seismic testing, core drilling or pilot production, regardless of the status of any development approval, will not be permitted during the moratorium period. The only logically consistent approach to take to current exploration, given the very real concern about the lack of scientific evidence of the potential impacts of this industry, is to press pause on all activities.

Secondly, the bill creates a prohibition on any coal seam gas prospecting or mining within the Sydney metropolitan area or within the special catchment areas as declared under section 44 of the Sydney Water Catchment Management Act 1998. These provisions will see any petroleum titles, including exploration licences and production leases, cancelled. This will have an impact on current production and exploration activities, particularly for AGL at its Camden Gas Project. However, this bill recognises that on the balance of information available to date it is clear that coal seam gas development is simply not suitable within urban environments and our precious drinking water catchments. The risks are too great. We are taking action now to protect people and water supplies.

Valid arguments have been put that other areas should also be off limits to coal seam gas development. This bill targets those areas that are at immediate risk. Expansion plans are imminent for within the Sydney metropolitan area and already projects have been approved within Sydney's drinking water catchment. The water storages controlled by the Sydney Catchment Authority supply water to Sydney, the Illawarra, the Southern Highlands, the Blue Mountains and Kangaroo Valley. This bill does not call for coal seam gas mining to be prohibited across New South Wales, although it does seek to protect the Sydney metropolitan area and its drinking water catchments from this type of industrial development. The key feature of this bill is the 12-month moratorium—a much-needed pause to take stock of what we do and do not know about this industry. No government can legitimately choose to proceed with this industry, which is now so badly clouded in uncertainty and an increasingly bad track record around the country and the world. To push all that aside with the stroke of a pen and the promise of adaptive management is negligent.

**The Hon. Dr Peter Phelps:** What a nonsense. There is no evidence that would convince you and the rest of the Green extremists.

**The Hon. Lynda Voltz:** Point of order: It is difficult to hear the member when there are constant interjections from the Government Whip.

**DEPUTY-PRESIDENT (The Hon. Natasha Maclaren-Jones):** Order! I remind all members that interjections are disorderly at all times.

**The Hon. JEREMY BUCKINGHAM:** I conclude by highlighting one positive from the

experience of the past few years of communities confronted with the threat of coal seam gas. This assault on communities, which has been allowed to proceed under both Labor and Liberal governments, has brought the communities much more tightly together. It has resulted in campaign groups from Byron to the Illawarra and from the Southern Highlands to Kerrong and out to Narrabri. My staff has documented about 90-odd groups, many of whom are new and focused on coal seam gas. They are not Green groups: they are farmers and their wives and retirees. Some of them are tree changers and sea changers and many of them are professionals. Most of them have had enough of being ignored on this issue.

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I offer a warning to the Government on behalf of all those groups: This is the Government's chance to act—to take a precautionary approach to an industry that has not been proven safe and that has a disgraceful track record around the world. The Government should press "pause" now, carry out the assessment and weigh up the costs and benefits before it goes down this path. If the Government continues the way it is going this will be one of the biggest environmental campaigns this country has ever seen. I commend the bill to the House.

**Debate adjourned on motion by the Hon. Lynda Voltz and set down as an order of the day for a future day.**